

REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 8-11, 13-16, and 18-19 are presently active in this case, Claims 8 and 13 having been amended by way of the present Amendment.

Claim 8 was rejected under 35 U.S.C. 103(a) as being unpatentable over Weber (U.S. Patent No. 5,571,397) in view of Heinrichs et al. (DE 42 24 131). Claims 9-11 were rejected under 35 U.S.C. 103(a) as being unpatentable over Weber in view of Heinrichs et al. and further in view of page 2, line 4, of the present application. Claims 13, 14, 16, 18, and 19 were rejected under 35 U.S.C. 103(a) as being unpatentable over Weber in view of Heinrichs et al. and with or without Olson (U.S. Patent No. 5,984,138). Claim 15 was rejected under 35 U.S.C. 103(a) as being unpatentable over Weber in view of Heinrichs et al. and with or without Olson and further in view of page 2, line 4, of the present application.

Claim 8 of the present application recites an exhaust device for an internal combustion engine. The exhaust device comprises a measuring transducer configured to analyze a flow of exhaust gases from the engine, and a pipe element adapted to carry the flow of exhaust gases from the engine. The pipe element is defined as having an integral housing in which the measuring transducer is mounted. The housing includes a threaded hole extending through a bush extending only through a wall of the pipe element. The bush has an interior portion and an exterior portion, where the interior portion extends further within an interior of the pipe element than the exterior portion extends beyond an exterior of the pipe element.

The Applicants submit that the obviousness rejection of Claim 8 should be withdrawn since the cited Weber and Heinrichs et al. references fail to disclose or suggest, either singularly or combined, all of the limitations recited therein, as required by MPEP 2143 for

the establishment of a *prima facie* case of obviousness. For example, the cited references do not disclose or suggest an exhaust device comprising a pipe element having an integral housing that includes a threaded hole extending through a bush extending only through a wall of the pipe element.

The Weber reference describes a boron nitride exhaust seal that is used as a high temperature gasket material to prevent gas leakage between an exhaust gas oxygen sensor and the exhaust system of an internal combustion engine. A tubular zirconia ceramic sensing element (2) is attached to an exhaust pipe (4) by threading a metal shell (3) into a boss (5) in pipe (4).

The structure of the boss (5) depicted and described in the Weber reference is unclear. No specific details are provided in the Weber reference regarding how the boss (5) is formed. And clearly, the boss (5) of the Weber reference does not teach or suggest a bush having an interior portion and an exterior portion, where the interior portion extends further within an interior of the pipe element than the exterior portion extends beyond an exterior of the pipe element, as expressly recited in Claim 8 of the present application. Accordingly, the Heinrichs et al. reference is cited for the teaching of such a bush.

The Heinrich et al. reference describes a method of producing a connection socket on a pressure hose. The Heinrichs reference describes placing a disc (3) in a hole drilled in the side of a tube, making a flat surface (15) on top of the deformed disc and then making threads (17) within a bore (13).

The Official Action indicates that one of skill in the art would have looked to the teachings in the Heinrichs et al. reference to obtain the bush element recited in Claim 8 of the present invention. However, the Applicants respectfully submit that the Heinrichs et al. reference teaches a bore structure (13) that is significantly different from that recited in Claim

8, and in fact the Heinrichs et al. reference teaches away from the invention recited in Claim 8. The present application describes the significant disadvantages of using a welding ring, similar to the disc (3) used in the Heinrichs et al. reference, to form the structure of the bush element. For example, the inventors have determined that the use of welded rings suffers from a large percentage of defects in assembly and leaktightness. (See page 2, lines 3-23, and page 6, line 24, through page 7, line 10, of the present application.) Accordingly, the structure of the bush of the present invention as recited in Claim 8 is defined as extending only through a wall of the pipe element. The Heinrichs et al. reference clearly teaches away from such a structure, and therefore one of skill in the art would not have been motivated to combine the teachings of the Heinrichs et al. reference with the teachings of the Weber reference to arrive at the present invention.

The Applicants, therefore, respectfully submit that the rejection is based on the improper application of hindsight considerations. It is well settled that it is impermissible simply to engage in hindsight reconstruction of the claimed invention, using Applicants' structure as a template and selecting elements from the references to fill in the gaps. *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991). Simplicity and hindsight are not proper criteria for resolving obviousness. *In re Warner*, 397 F.2d 1011, 154 USPQ 173 (CCPA 1967).

Accordingly, the Applicants request the withdrawal of the obviousness rejection of Claim 8 of the present application.

Claim 13 of the present application recites a process for making an exhaust device for an internal combustion engine. The process comprises the steps of forming an integral housing in a pipe element adapted to carry a flow of exhaust gases from the engine, the housing being formed from a flow-drilling operation comprising drilling through only a wall

of the pipe element with a tool at a speed and a penetration force adapted to cause melting and upsetting of a material of the wall around the tool in proportion to an advance of this tool until a bush of required height and diameter is obtained, wherein the bush has an interior portion and an exterior portion, the interior portion extending further within an interior of the pipe element than the exterior portion extends beyond an exterior of the pipe element. The process further comprises the steps of tapping a hole through the bush to form internal threads in the hole, and mounting within the housing a measuring transducer configured to analyze a flow of exhaust gases from the engine.

The Applicants submit that the obviousness rejection of Claim 13 should be withdrawn since the cited Weber, Heinrichs et al., and Olson references fail to provide a motivation to combine the various teachings therein, as required by MPEP 2143 for the establishment of a *prima facie* case of obviousness.

As discussed above, the structure of the boss (5) depicted and described in the Weber reference is unclear. No specific details are provided in the Weber reference regarding how the boss (5) is formed. And clearly, the boss (5) of the Weber reference does not teach or suggest the steps of forming an integral housing in a pipe element where the housing is formed from a flow-drilling operation comprising drilling through only a wall of the pipe element, as expressly recited in Claim 13 of the present invention. Accordingly, the Heinrichs et al. reference is cited for the teaching of a flow-drilling operation.

The Heinrich et al. reference describes a method of producing a connection socket on a pressure hose. The Heinrichs reference describes placing a disc (3) in a hole drilled in the side of a tube, making a flat surface (15) on top of the deformed disc and then making threads (17) within a bore (13).

The Official Action indicates that one of skill in the art would have looked to the teachings in the Heinrichs et al. reference to obtain flow-drilling operation step recited in Claim 13 of the present invention. However, the Applicants respectfully submit that the Heinrichs et al. reference teaches a drilling operation that is significantly different from that recited in Claim 13, and in fact the Heinrichs et al. reference teaches away from the invention recited in Claim 13. The present application describes the significant disadvantages of using a welding ring during the formation of a housing for the sensor, similar to the process used in the Heinrichs et al. reference, to form the housing. For example, the inventors have determined that the use of welded rings suffers from a large percentage of defects in assembly and leaktightness. (See page 2, lines 3-23, and page 6, line 24, through page 7, line 10, of the present application.) Accordingly, the housing in the pipe element as recited in Claim 13 is defined as being formed from a flow-drilling operation comprising drilling through only a wall of the pipe element. The Heinrichs et al. reference clearly teaches away from such a structure, and therefore one of skill in the art would not have been motivated to combine the teachings of the Heinrichs et al. reference with the teachings of the Weber reference to arrive at the present invention.

The Olson reference is cited in the alternative for the teaching of the use of flow drilling. However, the Olson reference is specifically design for use with push-to-connect couplings. Note that the specification including drawings repeatedly and consistently describe the invention therein as being used with push-to-connect couplings. In fact, the claims of the Olson reference are direct to an improvement in the push-to-connect coupling itself. Furthermore, column 3, lines 3-6, state that “[t]he holes 18 are provided usually for receiving fluid couplings, *which in accordance with the principals of the present invention are preferably quick-connect couplings such as the coupling illustrated in FIGS. 6 and 7.*”

(Emphasis added.) The Applicants submit that one of skill in the art would not have been motivated to combine the Olson reference's teaching of the formation of a bushing (42) for use specifically with a push-to-connect coupling with the Weber reference or the Heinrichs et al. reference, which depict threaded bores. One of skill in the art would not have a motivation to combine the Olson reference with the Weber or Heinrichs et al. references, since the Olson reference teaches the specific use with push-to-connect coupling thereby teaching away from the use with threaded couplings, and since the addition of a tapping step to add threads to the bushing (42) would damage the structural integrity of the bushing (42).

The Applicants, therefore, respectfully submit that the rejection is based on the improper application of hindsight considerations. It is well settled that it is impermissible simply to engage in hindsight reconstruction of the claimed invention, using Applicants' structure as a template and selecting elements from the references to fill in the gaps. *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991). Simplicity and hindsight are not proper criteria for resolving obviousness. *In re Warner*, 397 F.2d 1011, 154 USPQ 173 (CCPA 1967).

Accordingly, the Applicants request the withdrawal of the obviousness rejection of Claim 13 of the present application.

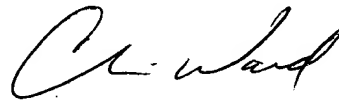
Claims 9-11, 14-16, and 18-19 are considered allowable for the reasons advanced for Claims 8 and 13 from which they depend. These claims are further considered allowable as they recite other features of the invention that are neither disclosed, taught, nor suggested by the applied references when those features are considered within the context of Claims 8 and 13.

Consequently, in view of the above discussion, it is respectfully submitted that Claims 8-11, 13-16, and 18-19 are patentably distinguishing over the cited art. The present

application is therefore believed to be in condition for formal allowance and an early and favorable reconsideration of this application is therefore requested.

Respectfully submitted,

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IN THE CLAIMS

Please amend Claims 8 and 13 as follows:

8. (Twice Amended) An exhaust device for an internal combustion engine, said exhaust device comprising:

a measuring transducer configured to analyze a flow of exhaust gases from the engine;
and

a pipe element adapted to carry the flow of exhaust gases from the engine, said pipe element having an integral housing in which said measuring transducer is mounted, said housing including a threaded hole extending through a bush [made directly] extending only through a wall of said pipe element,

wherein said bush has an interior portion and an exterior portion, said interior portion extending further within an interior of said pipe element than said exterior portion extends beyond an exterior of said pipe element.

13. (Twice Amended) A process for making an exhaust device for an internal combustion engine, said process comprising the steps of:

forming an integral housing in a pipe element adapted to carry a flow of exhaust gases from the engine, the housing being formed from a flow-drilling operation comprising drilling through only a wall of the pipe element with a tool at a speed and a penetration force adapted to cause melting and upsetting of a material of the wall around the tool in proportion to an advance of this tool until a bush of required height and diameter is obtained, wherein the bush has an interior portion and an exterior portion, the interior portion extending further within an

interior of the pipe element than the exterior portion extends beyond an exterior of the pipe element;

tapping a hole through the bush to form internal threads in the hole; and

mounting within the housing a measuring transducer configured to analyze a flow of exhaust gases from the engine.